Ref #	Hits	Search Query	DBs	Default Operator	Plurals	Time Stamp
S2	1	("20040034800").PN.	US-PGPUB; USPAT	OR	OFF	2006/10/20 21:11
S3	14	netscout.asn.	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 12:02
54	1101	(726/22-23).CCLS.	US-PGPUB; USPAT	OR	OFF	2006/10/20 12:02
S5	449	(726/23).CCLS.	US-PGPUB; USPAT	OR	OFF	2006/10/20 12:03
S6	178	(726/23).CCLS.	USPAT	OR	OFF	2006/10/20 18:14
S7	0	("20030061506").PN.	USPAT	OR	OFF	2006/10/20 12:43
S8	1	("20030061506").PN.	US-PGPUB; USPAT	OR	OFF	2006/10/20 12:51
S9	1	("6499107").PN.	US-PGPUB; USPAT	OR	OFF	2006/10/20 13:49
S11	. 125	S4 and probe	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 13:50
S12	211	S4 and (conver\$4 modif\$5 switch\$3 conform\$3) with (packet segment)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 16:30
S13	132	("5835726").URPN.	USPAT	OR	ON	2006/10/20 13:54
S14	8	(network near4 performance near4 probe) same (conver\$4 modif\$5 switch\$3 conform\$3) with (packet segment)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON .	2006/10/20 19:37
S15	2	(("20020083344") or ("20020087882")).PN.	US-PGPUB; USPAT	OR	OFF	2006/10/20 17:21
S16	0	(network near4 performance near4 sentry) same (conver\$4 modif\$5 switch\$3 conform\$3) with (packet segment)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 17:08



S17	4	(("6,704,874") or ("6,182,226") or ("6,681,331") or ("6,363,489")).PN.	US-PGPUB; USPAT	OR	OFF	2006/10/20 17:21
S18	271	(726/23).CCLS.	US-PGPUB	OR	OFF	2006/10/20 18:14
S19	. 85	(network near4 performance near4 probe)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR ·	ON	2006/10/20 19:54
S20	41	(performance same probe) same (conver\$4 modif\$5 switch\$3 conform\$3) with (packet segment)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 19:31
S21	2	(ngenius)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 19:33
S22	130	performance same network same (openView NetView NetCool Unicenter NetHealth)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 19:34
S23	117	performance same network same (openView NetCool Unicenter NetHealth)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 19:37
S24	58	(network near4 performance with router) same (conver\$4 modif\$5 switch\$3 conform\$3) with (packet segment)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 19:43

		1	1		1	
S25	26	(("5,455,865") or ("5,844,986") or ("20020059516") or ("5,548,646") or ("6,158,011") or ("6,012,088") or ("5,968,176") or ("6,640,248") or ("5,903,558") or ("6,023,724") or ("5,790,546") or ("5,274,631") or ("5,559,883") or ("5,987,611") or ("5,561,669") or ("6,138,239") or ("5,566,225") or ("6,006,272") or ("6,243,667") or ("5,862,452") or ("5,999,981") or ("5,991,881") or ("5,414,833") or ("5,991,881") or ("6,377,571") or ("6,105,027")).PN.	US-PGPUB; USPAT	OR	OFF	2006/10/20 20:08
S26	150	(network same performance near4 probe)	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 19:55
S27	. 80	(network same performance near4 probe) not S19	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 19:55
S28	0	translate with data with wan/lan	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:08
S29		translate with data with lan/wan	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:09
S30	0	translate with packet with lan/wan	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:09
S31	27	packet same router same wan same lan same monitor	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:10

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S32	11697	protocol with conversion .	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:25
S33	231	protocol with router with conversion same network	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:26
S34	0	protocol with router with conversion same network same monitor same performance	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:26
S35	14	protocol with conversion same network same monitor same performance	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON .	2006/10/20 20:28
S36	1	packet with conversion same network same monitor same performance	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:28
S37	50	wan same lan same network same monitor same performance	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 20:28
S38	. 17	(probe sniffer) same audit adj trail	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 21:28
S39	1	("7017186").PN.	US-PGPUB; USPAT	OR	OFF	2006/10/20 21:46
S40	104	intrusion adj detection and (filter\$3 remov\$3) same voice	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 21:47

S41	0	intrusion adj detection and (filter\$3 remov\$3) same voice adj ip	US-PGPUB; USPAT;	OR	ON	2006/10/20 21:47
			USOCR; EPO; JPO; DERWENT; IBM_TDB	,		
S42	13	intrusion adj detection and (filter\$3 remov\$3) same voice near4 ip	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON	2006/10/20 21:53
S43	89	(filter\$3 remov\$3) with voice near4 ip	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR .	ON	2006/10/20 22:03
S44	174	(filter\$3 remov\$3) with oam	US-PGPUB; USPAT; USOCR; EPO; JPO; DERWENT; IBM_TDB	OR	ON .	2006/10/20 22:03





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1 Timescales and stability: A non-instrusive, wavelet-based approach to detecting



network performance problems

Polly Huang, Anja Feldmann, Walter Willinger

November 2001 Proceedings of the 1st ACM SIGCOMM Workshop on Internet Measurement

Publisher: ACM Press

Full text available: pdf(3.01 MB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u> terms

The main objective of this paper is to explore how much information about the characteristics of end-to-end network paths can be inferred from relying solely on passive packet-level traces of existing traffic collected from a single tap point in the network. To this end, we show that a number of structural properties of aggregate TCP/IP packet traces reveal themselves and can be compared across different time periods and across paths of the traffic destined to different subnets by exploiting the ...

Keywords: energy function, network performance, passive measurements, scale-localization, wavelets

2 A fast string-matching algorithm for network processor-based intrusion detection





Rong-Tai Liu, Nen-Fu Huang, Chih-Hao Chen, Chia-Nan Kao

August 2004 ACM Transactions on Embedded Computing Systems (TECS), Volume 3 Issue

Publisher: ACM Press

Full text available: pdf(571.00 KB) Additional Information: full citation, abstract, references, index terms

Network intrusion detection systems (NIDSs) are one of the latest developments in security. The matching of packet strings against collected signatures dominates signature-based NIDS performance. Network processors are also one of the fastest growing segments of the semiconductor market, because they are designed to provide scalable and flexible solutions that can accommodate change quickly and economically. This work presents a fast string-matching algorithm (called FNP) over the network proces ...

Keywords: Intrusion detection, network, pattern matching, processor

3 Special feature: Report on a working session on security in wireless ad hoc networks

Levente Buttyán, Jean-Pierre Hubaux



7 Issue 1 **Publisher: ACM Press**

Full text available: T pdf(2.50 MB)

Additional Information: full citation, references, citings

4 An on-demand secure routing protocol resilient to byzantine failures

Baruch Awerbuch, David Holmer, Cristina Nita-Rotaru, Herbert Rubens

September 2002 Proceedings of the 3rd ACM workshop on Wireless security WiSE '02

Publisher: ACM Press

Full text available: Tpdf(233.97 KB)

Additional Information: full citation, abstract, references, citings, index

An ad hoc wireless network is an autonomous self-organizing system ofmobile nodes connected by wireless links where nodes not in directrange can communicate via intermediate nodes. A common technique usedin routing protocols for ad hoc wireless networks is to establish therouting paths on-demand, as opposed to continually maintaining acomplete routing table. A significant concern in routing is theability to function in the presence of byzantine failures whichinclude nodes that drop, modify, or m ...

Keywords: ad hoc wireless networks, byzantine failures, on-demand routing, security

5 Protocol scrubbing: network security through transparent flow modification David Watson, Matthew Smart, G. Robert Malan, Farnam Jahanian April 2004 IEEE/ACM Transactions on Networking (TON), Volume 12 Issue 2

Publisher: IEEE Press

Full text available: pdf(316.54 KB) Additional Information: full citation, abstract, references, index terms

This paper describes the design and implementation of protocol scrubbers. Protocol scrubbers are transparent, interposed mechanisms for explicitly removing network scans and attacks at various protocol layers. The transport scrubber supports downstream passive network-based intrusion detection systems by converting ambiguous network flows into well-behaved flows that are unequivocally interpreted by all downstream endpoints. The fingerprint scrubber restricts an attacker's ability to determine t ...

Keywords: intrusion detection, network security, protocol scrubber, stack fingerprinting

6 Bandwidth and traffic estimation techniques: Single-hop probing asymptotics in available bandwidth estimation: sample-path analysis

Xiliang Liu, Kaliappa Ravindran, Benyuan Liu, Dmitri Loguinov

October 2004 Proceedings of the 4th ACM SIGCOMM conference on Internet measurement

Publisher: ACM Press

Full text available: 📆 pdf(420.64 KB) Additional Information: full citation, abstract, references, index terms

In this paper, we take the sample-path approach in analyzing the asymptotic behavior of single-hop bandwidth estimation under bursty cross-traffic and show that these results are provably different from those observed under fluid models of prior work. This difference, which we call the probing bias, is one of the previously unknown factors that can cause measurement inaccuracies in available bandwidth estimation. We present an analytical formulation of "packet probing," based on which we deri ...







Keywords: bandwidth measurement, packet train probing

7 Fast detection of communication patterns in distributed executions

Thomas Kunz, Michiel F. H. Seuren

November 1997 Proceedings of the 1997 conference of the Centre for Advanced Studies on Collaborative research

Publisher: IBM Press

Full text available: R pdf(4.21 MB) Additional Information: full citation, abstract, references, index terms

Understanding distributed applications is a tedious and difficult task. Visualizations based on process-time diagrams are often used to obtain a better understanding of the execution of the application. The visualization tool we use is Poet, an event tracer developed at the University of Waterloo. However, these diagrams are often very complex and do not provide the user with the desired overview of the application. In our experience, such tools display repeated occurrences of non-trivial commun ...

End-to-end internet packet dynamics

Vern Paxson

June 1999 IEEE/ACM Transactions on Networking (TON), Volume 7 Issue 3

Publisher: IEEE Press

Full text available: pdf(194.20 KB) Additional Information: full citation, references, citings, index terms

Keywords: computer network performance, computer network reliability, computer networks, failure analysis, internet-working, stability

9 Integrating heterogeneous wireless technologies: a cellular aided mobile Ad Hoc network (CAMA)

Bharat Bhargava, Xiaoxin Wu, Yi Lu, Weichao Wang

August 2004 Mobile Networks and Applications, Volume 9 Issue 4

Publisher: Kluwer Academic Publishers

Full text available: pdf(365.14 KB) Additional Information: full citation, abstract, references, index terms

A mobile ad hoc network is a collection of wireless terminals that can be deployed rapidly. Its deficiencies include limited wireless bandwidth efficiency, low throughput, large delays, and weak security. Integrating it with a well-established cellular network can improve communication and security in ad hoc networks, as well as enrich the cellular services. This research proposes a cellular-aided mobile ad hoc network (CAMA) architecture, in which a CAMA agent in the cellular network manages th ...

Keywords: ad hoc networks, cellular networks, heterogeneous networks, quality of service, security

10 End-to-end available bandwidth: measurement methodology, dynamics, and relation



with TCP throughput

Manish Jain, Constantinos Dovrolis

August 2002 ACM SIGCOMM Computer Communication Review, Proceedings of the 2002 conference on Applications, technologies, architectures, and protocols for computer communications SIGCOMM '02, Volume 32 Issue 4

Publisher: ACM Press

Additional Information: full citation, abstract, references, citings, index

Full text available: pdf(400.95 KB)

terms

The available bandwidth (avail-bw) in a network path is of major importance in congestion control, streaming applications, QoS verification, server selection, and overlay networks. We describe an end-to-end methodology, called Self-Loading Periodic Streams (SLoPS), for measuring avail-bw. The basic idea in SLoPS is that the one-way delays of a periodic packet stream show an increasing trend when the stream's rate is higher than the avail-bw. We implemented SLoPS in a tool called pathload. The ac ...

Keywords: active probing, bottleneck bandwidth, bulk transfer capacity, network capacity, packet pair dispersion

11 Session 3: The limits of global scanning worm detectors in the presence of

background noise

David W. Richardson, Steven D. Gribble, Edward D. Lazowska

November 2005 Proceedings of the 2005 ACM workshop on Rapid malcode WORM '05

Publisher: ACM Press

Full text available: pdf(430.11 KB) Additional Information: full citation, abstract, references, index terms

Internet worms cause billions of dollars in damage each year. To combat them, researchers have been exploring global worm detection systems to spot a new random scanning worm outbreak quickly. These systems passively listen for worm probes on unused IP addresses, looking for anomalous increases in probe traffic to distinguish the emergence of a new worm from background Internet noise. In this paper, we use analytic modeling, simulation, and measurement to understand how background noise impacts t ...

Keywords: computer security, computer worms, scanning worms, worm detection, worm models

12 Information warfare: Learning attack strategies from intrusion alerts

Peng Ning, Dingbang Xu

October 2003 Proceedings of the 10th ACM conference on Computer and communications security

Publisher: ACM Press

Full text available: pdf(248.17 KB)

Additional Information: full citation, abstract, references, citings, index terms

Understanding strategies of attacks is crucial for security applications such as computer and network forensics, intrusion response, and prevention of future attacks. This paper presents techniques to automatically learn attack strategies from correlated intrusion alerts. Central to these techniques is a model that represents an attack strategy as a graph of attacks with constraints on the attack attributes and the temporal order among these attacks. To learn the intrusion strategy is then to ex ...

Keywords: alert correlation, intrusion detection, profiling attack strategies

13 Congestion: An empirical evaluation of wide-area internet bottlenecks

Aditya Akella, Srinivasan Seshan, Anees Shaikh
October 2003 Proceedings of the 3rd ACM SIGCOMM conference on Internet
measurement

Publisher: ACM Press

Full text available: pdf(428.31 KB)

Additional Information: full citation, abstract, references, citings, index terms

Conventional wisdom has been that the performance limitations in the current Internet lie at the edges of the network -- i.e last mile connectivity to users, or access links of stub ASes. As these links are upgraded, however, it is important to consider where new bottlenecks and hot-spots are likely to arise. In this paper, we address this question through an investigation of non-access bottlenecks. These are links within carrier ISPs or between neighboring carriers that could p ...

14 Monitoring and measurements: Optimal positioning of active and passive monitoring



devices

Claude Chaudet, Eric Fleury, Isabelle Guérin Lassous, Hervé Rivano, Marie-Emilie Voge October 2005 Proceedings of the 2005 ACM conference on Emerging network experiment and technology CoNEXT'05

Publisher: ACM Press

Full text available: 📆 pdf(783.63 KB) Additional Information: full citation, abstract, references, index terms

Network measurement is essential for assessing performance issues, identifying and locating problems. Two common strategies are the passive approach that attaches specific devices to links in order to monitor the traffic that passes through the network and the active approach that generates explicit control packets in the network for measurements. One of the key issues in this domain is to minimize the overhead in terms of hardware, software, maintenance cost and additional traffic. In this paper ...

Keywords: active monitoring, optimization, passive monitoring

15 Wireless troubleshooting: MOJO: a distributed physical layer anomaly detection





system for 802.11 WLANs Anmol Sheth, Christian Doerr, Dirk Grunwald, Richard Han, Douglas Sicker June 2006 Proceedings of the 4th international conference on Mobile systems, applications and services MobiSys 2006

Publisher: ACM Press

Full text available: Top pdf(444.15 KB) Additional Information: full citation, abstract, references, index terms

Deployments of wireless LANs consisting of hundreds of 802.11 access points with a large number of users have been reported in enterprises as well as college campuses. However, due to the unreliable nature of wireless links, users frequently encounter degraded performance and lack of coverage. This problem is even worse in unplanned networks, such as the numerous access points deployed by homeowners. Existing approaches that aim to diagnose these problems are inefficient because they troubleshoo ...

Keywords: anomaly detection, self-healing, wireless networks

16 End-to-end available bandwidth: measurement methodology, dynamics, and relation with TCP throughput



Manish Jain, Constantinos Dovrolis

August 2003 IEEE/ACM Transactions on Networking (TON), Volume 11 Issue 4

Publisher: IEEE Press

Full text available: pdf(934.74 KB)

Additional Information: full citation, abstract, references, citings, index

The available bandwidth (avail-bw) in a network path is of major importance in congestion control, streaming applications, quality-of-service verification, server selection, and overlay networks. We describe an end-to-end methodology, called self-loading periodic streams (SLoPS), for measuring avail-bw. The basic idea in SLoPS is that the one-way delays of a periodic packet stream show an increasing trend when the stream's rate is higher than the avail-bw. We implemented SLoPS in a tool called < ...

Keywords: active probing, bottleneck bandwidth, bulk transfer capacity, network capacity, packet pair dispersion

17 Probing the black box: Performance debugging for distributed systems of black boxes Marcos K. Aguilera, Jeffrey C. Mogul, Janet L. Wiener, Patrick Reynolds, Athicha



Muthitacharoen

October 2003 Proceedings of the nineteenth ACM symposium on Operating systems principles

Publisher: ACM Press

Full text available: pdf(408.85 KB)

Additional Information: <u>full citation</u>, <u>abstract</u>, <u>references</u>, <u>citings</u>, <u>index</u>

Many interesting large-scale systems are distributed systems of multiple communicating components. Such systems can be very hard to debug, especially when they exhibit poor performance. The problem becomes much harder when systems are composed of "blackbox" components: software from many different (perhaps competing) vendors, usually without source code available. Typical solutions-provider employees are not always skilled or experienced enough to debug these systems efficiently. Our goal is to ...

Keywords: black box systems, distributed systems, performance analysis, performance debugging

18 Communication over wireless LANs: DOMINO: a system to detect greedy behavior in



EEE 802.11 hotspots

Maxim Raya, Jean-Pierre Hubaux, Imad Aad

June 2004 Proceedings of the 2nd international conference on Mobile systems, applications, and services MobiSys '04

Publisher: ACM Press

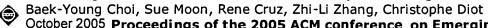
Full text available: pdf(301.61 KB)

Additional Information: full citation, abstract, references, citings, index

The proliferation of hotspots based on IEEE 802.11 wireless LANs brings the promise of seamless Internet access from a large number of public locations. However, as the number of users soars, so does the risk of possible misbehavior; to protect themselves, wireless ISPs already make use of a number of security mechanisms, and require mobile stations to authenticate themselves at the Access Points (APs). However, IEEE 802.11 works properly only if the stations also respect the MAC protocol. We sh ...

Keywords: IEEE 802.11, MAC, WISP, hotspot, misbehavior, wireless LAN

19 Monitoring and measurements: Practical delay monitoring for ISPs



October 2005 Proceedings of the 2005 ACM conference on Emerging network experiment and technology CoNEXT'05

Publisher: ACM Press

Full text available: pdf(2.25 MB) Additional Information: full citation, abstract, references, index terms

Point-to-point delay is an important network performance measure as well as a key parameter in SLAs. We study how to measure and report delay in a concise and meaningful way for an ISP, and how to monitor it efficiently. We analyze various measurement intervals and potential metric definitions. We find that reporting high quantiles (between 0.95 and 0.99) every 10-30 minutes as the most effective way to summarize the delay in an ISP. We then propose an active probing scheme to estimate a high qua ...

Keywords: active probing, delay, performance monitoring

20 Bandwidth: System capability effects on algorithms for network bandwidth



measurement

Guojun Jin, Brian L. Tierney

October 2003 Proceedings of the 3rd ACM SIGCOMM conference on Internet measurement

Publisher: ACM Press

Full text available: pdf(254.09 KB)

Additional Information: full citation, abstract, references, citings, index

A large number of tools that attempt to estimate network capacity and available bandwidth use algorithms that are based on measuring packet inter-arrival time. However in recent years network bandwidth has become faster than system input/output (I/O) bandwidth. This means that it is getting harder and harder to estimate capacity and available bandwidth using these techniques. This paper examines the current bandwidth measurement and estimation algorithms, and presents an analysis of how these al ...

Keywords: algorithm, bandwidth, design, estimation, measure, network, performance, system capability

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